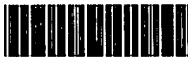
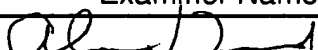


# ELECTRONIC INFORMATION DISCLOSURE STATEMENT

Electronic Version v18

Stylesheet Version v18.0

Title of Invention	GAS SPECIE ELECTRON-JUMP CHEMICAL ENERGY CONVERTER						
Application Number :		10/625801					
Confirmation Number:		9026					
First Named Applicant:		Anthony Zuppero					
Attorney Docket Number:		22122878-70					
Art Unit:							
Examiner:							
Search string:		( 6172427 ).pn					
<p><u>Certification:</u> This Information Disclosure Statement was submitted under the following conditions, which satisfies the requirement under 37 CFR 1.97(e). The filer certified:</p> <p>That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement.</p>							
<b>US Patent Documents</b>							
<b>Note: Applicant is not required to submit a paper copy of cited US Patent Documents</b>							
init	Cite.No.	Patent No.	Date	Patentee	Kind	Class	Subclass
60	1	6172427	2001-01-09	Shinohara et al.	—	—	—
<b>Remarks</b>							
<p>Note: Remarks are not for responding to an office action.</p> <p>This information disclosure statement is being filed under 37 C.F.R. 1.97(b)(4), before the mailing date of a first Office action after the filing of a request for continued examination under 1.114.</p>							
<b>Signature</b>							
Examiner Name				Date			
				5/10/05			

# ELECTRONIC INFORMATION DISCLOSURE STATEMENT

Electronic Version v18

Stylesheet Version v18.0

## Title of Invention

GAS SPECIE ELECTRON-JUMP CHEMICAL ENERGY  
CONVERTER

Application Number : 10/625801  
Confirmation Number: 9026  
First Named Applicant: Anthony Zuppero  
Attorney Docket Number: 22122878-70  
Art Unit: 1753  
Examiner: Alan D Diamond  
Search string: ( 3925235 ).pn



Certification: This Information Disclosure Statement was submitted under the following conditions, which satisfies the requirement under 37 CFR 1.97(e). The filer certified:

That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement.

## US Patent Documents

**Note:** Applicant is not required to submit a paper copy of cited US Patent Documents

init	Cite.No.	Patent No.	Date	Patentee	Kind	Class	Subclass
PO	1	3925235	1975-12-09	Lee	-	-	-

## Signature

Examiner Name	Date
	5/10/05

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Sheet	1	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

[illegible][illegible]

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# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

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Sheet 2 of 62

**Complete if Known**

Application Number 10/625,801  
 Filing Date 7/23/2003  
 First Named Inventor Anthony C. Zuppero  
 Art Unit 1753  
 Examiner Name Alan D. Diamond  
 Attorney Docket Number 22122878-70

Examiner Initials*	Cite No.	U. S. PATENT DOCUMENTS		Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Document Number Number-Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY		
AD	5	US- 20020070832	06-2002	Zuppero et al.	
AD	6	US- 4651324	03-1987	Prehn et al.	
AD	7	US- 5337329	08-1994	Foster, Jack	
AD	8	US- 4756000	07-1988	Macken, John A.	
AD	9	US- 5999547	12-1999	Schneider et al.	
AD	10	US- 5048042	09-1991	Moser et al.	
AD	11	US- 5587827	12-1996	Hakimi et al.	
AD	12	US- 4012301	03-1977	Rich et al.	
AD	13	US- 5470395	11-1995	Yater et al.	
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		Foreign Patent Document Country Code <sup>4</sup> Number <sup>4</sup> Kind Code <sup>4</sup> (if known)	Publication Date MM-DD-YYYY			

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

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Date Considered

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<sup>1</sup> Unique citation designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. <sup>6</sup> App. X to be placed a check mark here if English language Translation is attached.

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Sheet 4 of 62

**Complete If Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

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Sheet 6 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	12
ADD	22	HARRISON, P. et al., The Carrier Dynamics of Far-Infrared Intersubband Lasers and Tunable Emitters, Institute of Microwaves and Photonics, University of Leeds, U.K., pp. 1-64 (Date Unknown).	
ADD	23	WEBER, et al., $\alpha$ X2 Electron Transfer Times in Type-II GaAs/AlAs Superlattices Due to Emission of Confined and Interface Phonons, Superlattices and Microstructures, Vol. 23, No. 2 (1998).	
ADD	24	FANN, W.S. et al., Electron Thermalization in Gold, Physical Review B, Brief Reports, Vol. 46, No. 20, (1992)	
ADD	25	Ultrafast Surface Dynamics Group, Time-Resolved Two-Photon Photoemission (TR-2PPE), <a href="http://www.lip.physik.uni-essen.de/aeschlmann/2y_photo.htm">http://www.lip.physik.uni-essen.de/aeschlmann/2y_photo.htm</a> (Date Unknown)	
ADD	26	LEWIS et al., Vibrational Dynamics of Molecular Overlayers on Metal Surfaces, Dept of Chemistry, University of Pennsylvania, <a href="http://lorax.chem.upenn.edu/mol_surf/cu_cotalk.html">http://lorax.chem.upenn.edu/mol_surf/cu_cotalk.html</a> . (Date Unknown).	
ADD	27	RETTNER et al., Dynamics of the Chemisorption of O <sub>2</sub> on Pt(111): Dissociation via Direct Population of a Molecularly Chemisorbed Precursor at High Incidence Kinetic Energy, The Journal of Chemical Physics, Vol. 94, Issue 2 (1991)	
ADD	28	FRIEDMAN et al., SiGe/Si THz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy Hole Standards, Applied Physics Letters, Vol. 78, No. 4 (2001)	
ADD	29	HARRISON et al., Population Inversion and Gain Estimates for a Semiconductor TASER (Date Unknown)	
ADD	30	HARRISON et al., Theoretical Studies of Subband Carrier Lifetimes in an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998)	
ADD	31	HARRISON et al., Room Temperature Population Inversion in SiGe TASER Designs, IMP, School of Electronic and Electrical Engineering, The University of Leeds (Date Unknown).	
ADD	32	SUN et al., Phonon-Pumped Terahertz Gain in n-Type GaAs/AlGaAs Superlattices, Applied Physics Letters, Vol. 7, No. 22 (2001)	

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Sheet 7 of 62

## **Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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Examiner Initials	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	72
ADD	33	ALTUKHOV et al., Towards Si-xGe Quantum-Well Resonant-State Terahertz Laser, Applied Physics Letters, Vol. 79, No. 24 (2001)	
ADD	34	SUN et al., Intersubband Lasing Lifetimes of SiGe/Si and GaAs/AlGaAs Multiple Quantum Well Structures, Applied Physics Letters, Vol. 66, No. 25 (1995)	
ADD	35	SUN et al., Phonon Pumped SiGe/Si Interminiband Terahertz Laser (Date Unknown)	
ADD	36	SOREF et al., Terahertz Gain in a SiGe/Si Quantum Staircase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, Vol. 79, No. 22 (2004)	
ADD	37	AESCHLIMANN et al., Competing Nonradiative Channels for Hot Electron-Induced Surface Photochemistry, Chemical Physics 202, 127-141 (1996)	
ADD	38	AUERBACH, Daniel J., Hitting the Surface-Softly, Science, Vol. 294, pp. 2488-2489 (2001)	
ADD	39	BADESCU et al., Energetics and Vibrational States for Hydrogen on Pt(111), Physical Review Letters, Vol. 88, No. 13 (2002)	
ADD	40	BALANDIN et al., Effect of Phonon Confinement on the Thermoelectric Figure of Merit of Quantum Wells, Journal of Applied Physics, Vol. 84, No. 11 (1998)	
ADD	41	BARTELS et al., Coherent Zone-Folded Longitudinal Acoustic Phonons in Semiconductor Superlattices: Excitation and Detection, Physical Review Letters, Vol. 82, No. 5 (1989)	
ADD	42	BAUMBERG et al., Ultrafast Acoustic Phonon Ballistics in Semiconductor Heterostructures, Physical Review Letters, Vol. 78, No. 17 (1997)	
ADD	43	BEDURFTIG et al., Vibrational and Structural Properties of OH Adsorbed on Pt(111), Journal of Chemical Physics, Vol. 111, No. 24 (1999)	

Examiner  
Signature

*Alan D. Diamond*

Date  
Considered

5/10/05

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Sheet 8 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume/issue number(s), publisher, city and/or country where published	T <sup>2</sup>
ADD	44	VALDEN et al., Onset of Catalytic Activity of Gold Clusters on Titania with the Appearance of Nonmetallic Properties, Science, Vol. 281 (1998)	
ADD	45	BONDZIE et al., Oxygen Adsorption on Well-Defined Gold Particles on TiO <sub>2</sub> (110), J. Vac. Sci. Technol. A17(4) (1999)	
ADD	46	BEZANT et al., Intersubband Relaxation Lifetime in p-GaAs/AlGaAs Quantum Wells Below the LO-Phonon Energy Measured in a Free Electron Laser Experiment, Semicond. Sci. Technol. 14 (1999)	
ADD	47	BRAKO et al., Interaction of CO Molecules Adsorbed on Metal Surfaces, Vacuum 61,89-93 (2001)	
ADD	48	BURGI et al., Confinement of Surface State Electrons in Fabry-Perot Resonators, Physical Review Letters, Vol. 81, No. 24 (1998)	
ADD	49	BURGI et al., Probing Hot-Electron Dynamics at Surfaces with a Cold Scanning Tunneling Microscope, Physical Review Letters, Vol. 82, No. 22 (1999).	
ADD	50	CHANG, Y.M., Interaction of Electron and Cold Plasma with Coherent Longitudinal Optical Phonons in GaAs, Applied Physics Letter, Vol. 80, No. 14 (2002)	
ADD	51	CHANG et al., Observation of Coherent Surface Optical Phonon Oscillations by Time-Resolved Surface Second-Harmonic Generation, Physical Review Letters, Vol. 78, No. 24 (1997)	
ADD	52	CHANG et al., Coherent Phonon Spectroscopy of GaAs Surfaces Using Time-Resolved Second-Harmonic Generation, Chemical Physics 251, 283-308 (2000)	
ADD	53	CHANG et al. Observation of Local-Interfacial Optical Phonons at Buried Interfaces Using Time-Resolved Second Harmonic Generation, Physical Review B, Vol. 59, No. 19 (1999)	
ADD	54	CHEN et al., Stimulate-Emission-Induced Enhancement of the Decay Rate of Longitudinal Optical Phonons in III-V Semiconductors; Applied Physics Letters, Vol. 80, No. 16 (2002)	

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**INFORMATION DISCLOSURE  
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Sheet 9 of 62**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	TS
ADD	55	CORCELLI et al., Vibrational Energy Pooling in CO on NaCl(100): Methods, Journal of Chemical Physics, Vol. 116, No. 18 (2002).	
ADD	56	FIERZ et al., Time-Resolved 2-Photon Photoionization on Metallic Nanoparticles, Appl. Phys. B 68 (1999); <a href="http://www.lfp.physik.uni-essen.de/aeschlimann/abstract1.htm#6">http://www.lfp.physik.uni-essen.de/aeschlimann/abstract1.htm#6</a>	
ADD	57	BEZANT et al., Intersubband Relaxation Lifetimes in p-GaAs/AlGaAs Quantum Wells Below the LO-Phonon Energy Measured in a Free Electron Laser Experiment, Semicond. Sci. Technol., 14 No. 8 (1999).	Same as cite no. 46
ADD	58	BONDZIE et al., Oxygen Adsorption on Well-Defined Gold Particles on TiO <sub>2</sub> (110), Journal of Vacuum Science & Technology A: Vacuum, Surfaces and Films, Vol. 17, Issue 4, pp. 1717-1720 (1999).	Same as cite no. 45
ADD	59	HARRISON et al., Maximising the Population Inversion, by Optimizing the Depopulation Rate, in Far-Infrared Quantum Cascade Lasers (2001)	
ADD	60	HARRISON et al., The Carrier Dynamics of Terahertz Intersubband Lasers, Some Publishing Company (1999)	
ADD	61	FANN et al., Electron Thermalization in Gold, Physical Review B, Vol. 46, No. 20 (1992)	
ADD	62	CUMMINGS et al., Ultrafast Impulsive Excitation of Coherent Longitudinal Acoustic Phonon Oscillations in Highly Photoexcited InSb, Applied Physics Letters, Vol. 79, No. 6 (2001)	Same as cite no. 24
ADD	63	CHIANG, T.C., Photoemission Studies of Quantum Well States in Thin Films, Surface Science Reports 39, pp. 181-235 (2000).	
ADD	64	DEBERNARDI et al., Anharmonic Phonon Lifetimes in Semiconductors from Density-Functional Perturbation Theory, Physical Review Letters, Vol. 76, No. 9 (1995)	
ADD	65	DAVIS et al., Kinetics and Dynamics of the Dissociative Chemisorption of Oxygen on Ir(111), J. Chem. Phys. 109 (3) (1997).	

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Sheet 10 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	fe.
ADD	66	CHOI et al., Ultrafast Carrier Dynamics in a Highly Excited GaN Epilayer, Physical Review B, Vol. 63, 115315 (2001)	✓
ADD	67	DIEKHONER et al., Parallel Pathways in Methanol Decomposition on Pt(111), Surface Science 409, pp. 384-391 (1998)	✓
ADD	68	DEMIDENKO et al., Piezoelectrically Active Acoustic Waves Confined in a Quantum Well and Their Amplification by electron Drift, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 3, No. 4, pp. 427-431 (2000)	✓
ADD	69	de PAULA et al., to X2 Electron Transfer Times in Type-II Superlattices Due to Emission of Confined Phonons, Appl. Phys. Lett. 65 (10) (1994)	✓
ADD	70	de PAULA et al., Carrier Capture via Confined Phonons in GaAs-AlGaAs Multiple Quantum Wells, Second. Sci. Technol. 9, pp. 730-732 (1994)	✓
ADD	71	DEMIDENKO et al., Amplification of Localized Acoustic Waves by the Electron Drift in a Quantum Well, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 2, No. 1, pp. 11-24 (1999)	✓
ADD	72	DEMIDENKO et al., Generation of Coherent Confined Acoustic Phonons by Drifting Electrons in Quantum Wire, Semiconductor Physics, Quantum Electronics & Optoelectronics, Vol. 3, No. 4, pp. 432-437 (2000)	✓
ADD	73	DENZLER et al., Surface Femtochemistry: Ultrafast Reaction Dynamics Driven by Hot Electron Mediated Reaction Pathways, World Scientific (2001)	✓
ADD	74	FATTI et al., Temperature-Dependent Electron-lattice Thermalization in GaAs, Physical Review B, Vol. 59, No. 7 (1999)	✓
ADD	75	ANASTASSAKIS et al., The Physics of Semiconductors, Vol. 2, World Scientific (1990)	✓
ADD	76	de PAULA et al., Carrier Capture Processes in Semiconductor Superlattices due to Emission of confined Phonons, J. Appl. Phys. 77 (12) (1995)	✓

Same as cite no. 23

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Signature*Alan D. Diamond*Date  
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Sheet 11 of 62

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First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	77	ENGSTROM et al., Comparing the Vibrational Properties of Low-Energy Modes of a Molecular and an Atomic Adsorbate: CO and O on Pt(111), Journal of Chemical Physics, Vol. 112, No. 4 (2000)	
ADD	78	GLAVIN et al., Generation of High-Frequency Coherent Acoustic Phonons in a Weakly Coupled Superlattice, Applied Physics Letters, Vol. 74, No. 23 (1999)	
ADD	79	FRIEDMAN, SiGe/Si Thz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy-Hole Subbands, Applied Physics Letters, Vol. 78, No. 4 (2001)	Same as cite no. 28
ADD	80	ERMOSHIN et al., Vibrational Energy Relaxation of Adsorbate Vibrations: A theoretical Study of the H/S(111) System, J. Chem. Phys. 105 (20) (1996)	
ADD	81	GLAVIN et al., Acoustic Phonon Generation in A Superlattice Under the Hopping Perpendicular Transport, United Nations Educational Scientific and Cultural Organization and International Atomic Energy Agency (1998)	
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ADD	83	HAGSTON et al., Simplified Treatment of Scattering Processes in Quantum Well Structures, Journal of Applied Physics, Vol. 90, No. 3 (2001).	
ADD	84	HARRISON et al., Room Temperature Population Inversion in SiGe TASER designs (Date unknown)	Same as cite no. 31
ADD	85	HARRISON et al., The Carrier Dynamics of Terahertz Intersubband Lasers, Some Publishing Company (1999)	Same as cite no. 60
ADD	86	HARRISON et al., Population-Inversion and Gain Estimates for a Semiconductor Taser (Date unknown)	
ADD	87	HARRISON et al., Theoretical studies of Subband Carrier Lifetimes in an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998)	Same as cite no. 30

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Sheet 12 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	88	HARRISON et al., The Carrier Dynamics of Far-Infrared Intersubband Lasers and Tunable Emitters, <a href="http://www.ea.leeds.ac.uk/homes/ph1/">www.ea.leeds.ac.uk/homes/ph1/</a> (Date Unknown).	Same as cite no. 22
ADD	89	HESS et al., Hot Carrier Relaxation by Extreme Electron-LO Phonon Scattering in GaN (Date Unknown).	
ADD	90	HOHLFELD et al., Electron and Lattice Dynamics Following Optical Excitation of Metals, Chemical Physics 251, pp. 237-258 (2000)	
ADD	91	HUANG et al., Vibrational Promotion of Electron Transfer, Science, Vol. 290 (2000)	
ADD	92	KAWAKAMI et al., Quantum-well States in Copper Thin Films, Nature, Vol. 398 (1999)	
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ADD	95	LEWIS et al., Controlling Adsorbate Vibrational Lifetimes Using Superlattices, Physical Review B, Vol. 63, 085402 (2001)	
ADD	96	KOMIRENKO, Sergiy M., Phonons and Phonon-Related Effects in Prospective Nanoscale Semiconductor Devices (2000)	
ADD	97	HUANG et al., Observation of Vibrational Excitation and Deexcitation for NO(v=2) Scattering from Au(111): Evidence for Electron-Hole-Pair Mediate Energy Transfer, Physical Review Letters, Vol. 84, No. 13 (2000)	
ADD	98	LEWIS et al, Substrate-Adsorbate Coupling in Co-Adsorbed Copper, Physical Review Letters, Vol. 77, No. 26 (1996)	

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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ADD	99	KRAUSS et al., Coherent Acoustic Phonons in a Semiconductor Quantum Dot, Physical Review Letters, Vol. 79, No. 26 (1997)	✓
ADD	100	LUGLI et al., Interaction of Electrons with Interface Phonons in GaAs/AlAs and GaAs/AlGaAs Heterostructures, Semicond. Sci. Technol. 7 (1992)	✓
ADD	101	NIENHAUS et al., Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium, Physical Review Letters, Vol. 82, No. 2 (1999)	✓
ADD	102	MULET et al., Nanoscale Radiative Heat Transfer Between a Small Particle and a Plane Surface, Applied Physics Letters, Vol 78, No. 19 (2001)	✓
ADD	103	NIENHAUS et al., Direct Detection of Electron-Hole Pairs Generated by Chemical Reactions on Metal Surfaces, Surface Science 445, pp. 335-342 (2000)	✓
ADD	104	NIENHAUS, Hermann, Electronic Excitations by Chemical Reactions on Metal Surfaces, Surface Science Reports 45, pp. 1-78 (2002)	✓
ADD	105	NOLAN et al., Translational Energy selection of Molecular Precursors to Oxygen Adsorption on Pt(111), Physical Review Letters, Vol. 81, No. 15 (1998)	✓
ADD	106	NIENHAUS et al., Selective H Atom Sensors Using Ultrathin Ag/Si Schottky Diodes, Applied Physics Letters, Vol. 74, No. 26 (1999)	✓
ADD	107	NOLAN et al., Molecularly Chemisorbed Intermediates to Oxygen Adsorption on Pt(111): A Molecular Beam and Electron Energy-Loss Spectroscopy Study, Journal of Chemical Physics, Vol. 111, No. 8 (1999)	✓
ADD	108	NOLAN et al., Direct Verification of a High-Translational-Energy Molecular Precursor to Oxygen Dissociation on Pd(111), Surface Science 419 (1998)	✓
ADD	109	OGAWA et al., Optical Intersubband Transitions and Femtosecond Dynamics in Ag/Fs(100) Quantum Wells, Physical Review Letters, Vol. 88, No. 11 (2002)	✓

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Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

Sheet 14 of 62

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ADD	110	PLIHAL et al., Role of Intra-Adsorbate Coulomb Correlations in Energy Transfer at Metal Surfaces, Physical Review B, Vol. 58, No. 4 (1998)	-
ADD	111	PAGGEL et al., Quantum-Well States as Fabry-Perot Modes in a Thin-Film Electron Interferometer, Science, Vol. 283 (1999)	-
ADD	112	PAGGEL et al., Quasiparticle Lifetime in Macroscopically Uniform Ag/Fe(100) Quantum Wells, Physical Review Letters, Vol. 81, No. 25 (1998)	-
ADD	113	PAGGEL et al., Quantum Well Photoemission from Atomically Uniform Ag Films: Determination of Electronic Band Structure and Quasi-Particle Lifetime in Ag(100) Applied Surface Science 162-163, pp. 78-86 (2000)	-
ADD	114	PERSSON et al., A First-Principles Potential Energy Surface for Eley-Rideal Reaction Dynamics of H Atoms on Cu(111), Journal of Chemical Physics, Vol. 110, No. 4 (1999)	-
ADD	115	ÖZGÜR et al., Control of Coherent Acoustic Phonons in InGaN Multiple Quantum Wells, arXiv:cond-mat/0010170 (2000)	-
ADD	116	STANTON et al., Energy Relaxation by Hot Electrons in n-GaN Epilayers, Journal of Applied Physics, Vol. 89, No. 2 (2001)	-
ADD	117	STIPE et al., Atomistic Studies of O2 Dissociation on Pt(111) Induced by Photons, Electrons and by Heating, J. Chem. Phys. 107 (18) (1997)	-
ADD	118	SUN et al., Phonon Pumped SiGe/Si Interminiband Terahertz Laser, pp. 1-11 (date unknown).	-
		Same as cite no. 35	
ADD	119	SOREF et al., Terahertz Gain in a SiGe/Si Quantum Staircase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, Vol. 79, No. 22 (2001)	-
		Same as cite no. 36	
ADD	120	QU et al., Long-Lived Phonons, Physical Review B, Vol. 48, No. 9 (1993)	-

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
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ADD	121	PONTIUS, et al., Size-Dependent Hot-Electron Dynamics in Small Pdn-Clusters, Journal of Chemical Physics, Vol. 115, No. 22 (2001)	-
ADD	122	SMIT et al., Enhanced Tunneling Across Nanometer-Scale Metal-Semiconductor Interfaces, Applied Physics Letters, Vol. 80, No. 14 (2002)	-
ADD	123	QIU et al., Long-Distance and Damping of Low-Frequency Phonon Polariton in LiNbO3, Physical Review B, Vol. 66, No. 10 (1997)	-
ADD	124	ROUSSE et al., Non-Thermal Melting in Semiconductors Measured at Femtosecond Resolution, Nature, Vol. 410 (2001)	-
ADD	125	SCHELLING et al., Phonon Wave-Packet Dynamics at Semiconductor Interfaces by Molecular-Dynamics Simulation, Applied Physics Letters, Vol. 80, No. 14 (2002)	-
ADD	126	SHIKIN et al., Phase Accumulation Model Analysis of Quantum Well Resonances Formed in Ultra-Thin Ag, Au Films on W(110), Surface Science (2001)	-
ADD	127	SNOW et al., Ultrathin PtSi Layers Patterned by Scanned Probe Lithography, Applied Physics Letters, Vol. 79, No. 8 (2001)	-
ADD	128	PRABHU et al., Femtosecond Energy Relaxation of Nonthermal Electrons Injected in p-doped GaAs Base of a Heterojunction Bipolar Transistor, Journal of Applied Physics, Vol. 90, No. 1 (2001)	-
ADD	129	TSAI et al., Theoretical Modeling of Nonequilibrium Optical Phonons and Electron Energy Relaxation in GaN, Journal of Applied Physics, Vol. 85, No. 3 (1999)	-
ADD	130	TRIPA et al., Surface-Aligned Photochemistry: Aliming Reactive Oxygen Atoms Along a Single Crystal Surface, Journal of Chemical Physics, Vol. 112, No. 5 (2000)	-
ADD	131	TRIPA et al., Surface-Aligned Reaction of Photogenerated Oxygen Atoms with Carbon Monoxide Targets, Nature, Vol. 398 (1999)	-

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First Named Inventor	Anthony C. Zuppero
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Attorney Docket Number	22122878-70

Sheet 16 of 62

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ADD	133	TAYLOR et al., Strong Electron-LO Phonon Scattering and Hot Carrier Relaxation in GaN, Abstract No. ba249KW3 (Date Unknown)	-
ADD	134	SUN et al., Phonon-Pumped Terahertz Gain in n-Type GaAs/AlGaAs Superlattices, Applied Physics Letters, Vol. 78, No. 22 (2001)	-
		Same as cite no. 32	
ADD	135	TOM et al., Coherent Phonon and Electron Spectroscopy on Surfaces Using Time-Resolved Second-Harmonic Generation (Date Unknown)	-
ADD	136	TIUSAN et al., Quantum Coherent Transport Versus Diode-Like Effect in Semiconductor-Free Metal/Insulator Structure, Applied Physics Letters, Vol. 79, No. 25 (2001)	-
ADD	137	STROMQUIST et al., The Dynamics of H Absorption in and Adsorption on Cu(111), Surface Science 397, pp. 382-394 (1998)	-
ADD	138	TRIPA et al., Surface-Aligned Photochemistry: Aliming Reactive Oxygen Atoms Along a Single Crystal Surface, Journal of Chemical Physics, Vol. 112, No. 5 (2000)	-
		Same as cite no. 130	
ADD	139	TSAI et al., Theoretical Modeling of Nonequilibrium Optical Phonons and Electron Energy Relaxation in GaN, Journal of Applied Physics, Vol. 85, No. 3 (1999)	-
		Same as cite no. 129	
ADD	140	WEBER et al., Carrier Capture Processes in GaAs-AlGaAs Quantum Wells Due to Emission of Confined Phonons, Appl. Phys. Lett. 63 (22) (1993)	-
ADD	141	WINTERLIN et al., Atomic and Macroscopic Reaction Rates of a Surface-Catalyzed Reaction, Science, Vol. 278 (1997)	-
ADD	142	YEO et al., Calorimetric HEats for CO and Oxygen Adsorption and for the Catalytic CO Oxidation Reaction on Pt(111), J. Chem. Phys. 106 (1) (1997)	-

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Sheet 17 of 62

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Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS		
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published
ADD	143	WITTE et al., Low Frequency Vibrational Modes of Adsorbates, Surface Science, No. 1362 (2002)
ADD	144	VALDEN et al., Onset of Catalytic Activity of Gold Clusters on Titania with The Appearance of Nonmetallic Properties, Science, Vol. 281 (1998) <span style="float: right;">Same as cite no. 44</span>
ADD	145	XU et al., Electrical Generation of Terahertz Electromagnetic Pulses by Hot-Electrons in Quantum Wells, Superlattices and Microstructures, Vol. 22, No. 1 (1997)
ADD	146	WANKE et al., Injectorless Quantum-Cascade Lasers, Applied Physics Letters, Vol. 78, No. 25 (2001)
ADD	147	ZHDANOV, Vladimir P., Nm-Sized Metal Particles on a Semiconductor Surface, Schottky Model, etc., Surface Science, SUSC.2931 (2002)
ADD	148	YEO et al., Calorimetric Investigation of NO and O adsorption on Pd(100) and the Influence of Preadsorbed Carbon, J. Chem. Phys. 106 (5) (1997) <span style="float: right;">Same as cite no. 142</span>
ADD	149	ZAMBELLI et al., Complex Pathways in Dissociative Adsorption of Oxygen on Platinum, Nature, Vol. 390 (1997)
ADD	150	ZHDANOV et al., Substrate-Mediated Photoinduced Chemical Reactions on Ultrathin Metal Films, Surface Science 432 (1999)
ADD	151	ALTUKHOV et al., Towards Si1-xGe Quantum-well Resonant-State Terahertz Laser, Applied Physics Letters, Vol. 79, No. 24 (2001) <span style="float: right;">Same as cite no. 33</span>
ADD	152	FRIEDMAN et al., SiGe/Si THz Laser Based on Transitions Between Inverted Mass Light-Hole and Heavy-Hole Subbands, Applied Physics Letters, Vol. 78, No. 4 (2001) <span style="float: right;">Same as cite no. 28</span>
ADD	153	HARRISON et al., The Carrier Dynamics of Terahertz Intersubband Lasers, Some Publishing Company (1999) <span style="float: right;">Same as cite no. 60</span>

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**Complete If Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

Sheet 18 of 62

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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ADD	154	HARRISON et al., The Carrier Dynamics of Far-Infrared Intersubband Lasers and Tunable Emitters, www.ee.leeds.ac.uk/homes/ph/ (Date Unknown). Same as cite no. 22	-
ADD	155	HARRISON et al., Theoretical Studies of Subband Carrier Lifetimes in an Optically Pumped Three-Level Terahertz Laser, Superlattices and Microstructures, Vol. 23, No. 2 (1998). Same as cite no. 30	-
ADD	156	HARRISON et al., Room Temperature Population Inversion in SiGe TASER Designs (Date Unknown). Same as cite no. 31	-
ADD	157	HARRISON et al., Population-Inversion and Gain Estimates for a Semiconductor TASER, (Date Unknown). Same as cite no. 29	-
ADD	158	SUN et al., Phonon Pumped SiGe/Si Interband Terahertz Laser (Date Unknown). Same as cite no. 35	-
ADD	159	SOREF et al., Terahertz Gain in a SiGe/Si Quantum Staircase Utilizing the Heavy-Hole Inverted Effective Mass, Applied Physics Letters, vol. 79, No. 22 (2001). Same as cite no. 36	-
ADD	160	SUN et al., Intersubband Lasing Lifetimes of SiGe/Si and GaAs/AlGaAs Multiple Quantum Well Structures, Appl. Phys. Letter 66 (25) (1995). Same as cite no. 34	-
ADD	161	SUN et al., Phonon-Pumped Terahertz Gain in n-Type GaAs/AlGaAs Superlattices, Applied Physics Letters, Vol. 78, No. 22 (2001). Same as cite no. 32	-
ADD	162	ALBANO et al., Adsorption-Kinetics of Hot Dimers, SciSearch Database of the Institute for Scientific Information (1999)	-
ADD	163	CASASSA et al., Time-Resolved Measurements of Vibrational Relaxation of Molecules on surfaces: Hydroxyl Groups on Silica Surfaces, Journal of Vacuum Science & Technology A: Vacuum, Surfaces, and Films, Vol. 3, Issue 3 (1985)	-
ADD	164	CAVANAGH et al., Vibrational Relaxation of Adsorbed Molecules: Comparison with Relaxation Rates of Model Compounds, Journal of Vacuum Science & Technology A: Vacuum, Surfaces and Films, Vol. 5, Issue 4 (1987)	-

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Sheet 19 of 62

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	165	HYH et al., Methanol Oxidation of Palladium Compared to Rhodium at Ambient Pressures as Probed by Surface-Enhanced Raman and Mass Spectroscopies, <i>Journal of Catalysis</i> , Vol. 174 (2) (1998)	-
ADD	166	GUMHALTER et al., Effect of Electronic Relaxation on Covalent Adsorption Reaction Rates, <i>Physical Review B</i> , Vol. 30, Issue 6 (1984)	-
ADD	167	NOLAN et al., Surface Science, Direct Verification of a High-Translational-Energy Molecular Precursor to Oxygen Dissociation on Pd(111), <i>Surface Science</i> , Vol. 419 (1998)	-
ADD	168	PHIHAL et al., Role of Intra-Adsorbate Coulomb Correlations in Energy Transfer at Metal Surfaces, <i>Physical Review B</i> , Vol. 58, Issue 4 (1998)	-
ADD	169	TULLY et al., Electronic and Phonon Mechanisms of vibrational Relaxation: CO on Cu(100), <i>J. Vac. Sci. Technol. A</i> 11(4) (1993)	-
ADD	170	DIMATTEO et al., Enhanced Photogeneration of Carriers in a Semiconductor Via Coupling Across a Nonisothermal Nonascale Vacuum Gap, <i>Applied Physics Letters</i> , Vol. 79, Issue 12 (2001)	-
ADD	171	TRIPA et al., Surface-Aligned Photochemistry: Aliming Reactive Oxygen Atoms Along a Single Crystal Surface, <i>The Journal of Chemical Physics</i> , Vol. 112, Issue 5 (2000)	-
ADD	172	YATES et al., Special Adsorption and Reaction Effects at Step Defect Sites on Platinum Single Crystal Surfaces (2000)	-
ADD	173	DEKORSY et al., Coherent Acoustic Phonons in Semiconductor Superlattices, <i>phys. stat. sp.; (b)</i> 215, p 425-430 (1999)	-

Same as cite no. 110

Same as cite no. 130

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Sheet	21)	of	62
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**Complete If Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

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Sheet 21 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

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Sheet 22 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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ADD	184	AUERBACH, Daniel J.; "Hitting the Surface-Softly"; Science, 294, (2001), pp. 2488-2489	-
		Same as cite no. 38	
ADD	185	BONDZIE, V. A., et al.; "Oxygen adsorption ... gold particles ... TiO <sub>2</sub> (110)"; J. Vac. Sci. Tech. A, (1999) 17, pp. 1717 and figure 3	-
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ADD	186	BOULTER, James; "Laboratory Measurement of OH ..."; <a href="http://pearl1.lanl.gov/wsa2002/WSA2002talks.pdf">http://pearl1.lanl.gov/wsa2002/WSA2002talks.pdf</a> (2002).	-
ADD	187	CHAN H.Y.H., et al.; "Methanol Oxidation On Palladium Compared To Rhodium..."; J. Catalysis v. 174(82) pp. 191-200 (1998) (abstract and figure 1 only)	-
		Same as cite no. 165	
ADD	188	CHANG, T.-C.; "Photoemission studies of quantum well states in thin films; Surf. Sci. Rpts.39 (2000) pp 181-235	-
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ADD	189	CHUBB, D. L., et al; "Semiconductor Silicon as a Selective Emitter"; <a href="http://www.thermopv.org/TPV5-2-05-Chubb.pdf">http://www.thermopv.org/TPV5-2-05-Chubb.pdf</a> (abstract only) (Date unknown).	-
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ADD	192	DAVIS, J. E., et al.; "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)"; J. Chem. Phys. 107 (3), (1997), pp 943-952	-
		Same as cite no. 65	

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Sheet 23 of 62

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	193	DIEKHONER, L., et al.; "Parallel pathways in methanol... Pt(111)"; Surf. Sci. 409 (1998) pp 384-391	-
		Same as cite no. 67	
ADD	194	DIESING, D., et al.; "Aluminum oxide tunnel junctions..."; Thin Solid Films, Vol. 342 (1-2) (1999) pp. 282-290	-
ADD	195	DIMATTEO, R. S., et al.; "Enhanced photogeneration of carriers... vacuum gap"; Appl. Phys. Lett. (2001) 79, pp. 1894-1896	-
		Same as cite no. 170	
ADD	196	DIMATTEO, R. S., et al.; "Introduction to and Experimental Demonstration of Micron-gap ThermoPhotoVoltaics"; <a href="http://www.thermopv.org/37D/Dimatteo.html">http://www.thermopv.org/37D/Dimatteo.html</a> (abstract only) (Date Unknown).	-
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ADD	198	ECHENIQUE, P. M., et al.; "Surface-state electron dynamics in noble metals"; Prog. Surf. Sci., 67, (2001), pp 271-283	-
ADD	199	ENDO, Makoto, et al.; "Oxidation of methanol ... on Pt(111) ..."; Surf. Sci. 441 (1999) L931-L937, Surf. Sci. Letters	-
ADD	200	FAN, C. Y., et al.; "The oxidation of CO on RuO <sub>2</sub> ..."; J. Chem. Phys. 114, (2001), pp. 10058-10062	-
ADD	201	FANN, W.S., et al.; "Electron thermalization in gold"; Phys. Rev. B (1992) 46 pp. 13592-13595	-
		Same as cite no. 24	

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Sheet 24 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	202	OER, Adam T., et al.; "The dynamics of O <sub>2</sub> adsorption on Pt(533)..."; J. Chem. Phys.(2000) 113, pp. 10333-10343	-
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ADD	204	GULIANTS, Elena A, et al.; "A 0.5-µm-thick polycrystalline silicon Schottky..."; Appl. Phys. Lett., (2002), 80, pp. 1474-1476	-
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		Same as cite no. 166	
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		Same as cite no. 89	
ADD	210	HO, Wilson; <a href="http://www.lasp.cornell.edu/lasp_data/wilsonho.html">http://www.lasp.cornell.edu/lasp_data/wilsonho.html</a> (Date Unknown).	-

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Sheet 25 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
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ADD	211	HOHLFELD, J. et al.; "Electron and lattice dynamics ... optical excitation of metals"; Chemical Physics, 251 (2000) pp 237-258	-
		Same as cite no. 90	
ADD	212	HONKALA, Karolina, et al.; "Ab initio study of O2 precursor states on the Pd(111) ..."; J. Chem. Phys. (2001) 115, pp. 2297-2302	-
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ADD	214	HOU, H., et al.; "Direct multiquantum relaxation of highly vibrationally excited NO ..."; J. Chem. Phys., 110, (1999) pp 10660 - 10663	-
ADD	215	HUANG Y., et al.; "Observation of Vibrational Excitation and Deexcitation for NO from Au(111) ..."; Phys. Rev. Lett., 84, (2000) pp 2985 - 2988	-
		Same as cite no. 97	
ADD	216	HUANG, Yuhui, et al.; "Vibrational Promotion of Electron Transfer"; SCIENCE, VOL 290, 6 OCTOBER 2000, pp 111 - 113	-
		Same as cite no. 91	
ADD	217	IBH; "NanoLED overview"; <a href="http://www.ibh.co.uk/products/light_sources/nanoled_main.htm">http://www.ibh.co.uk/products/light_sources/nanoled_main.htm</a> (Date Unknown).	-
ADD	218	IBH; "Red picosecond laser sources"; <a href="http://www.ibh.co.uk/products/light_sources/nanoled/heads/red_laser_heads.htm">http://www.ibh.co.uk/products/light_sources/nanoled/heads/red_laser_heads.htm</a> (Date Unknown).	-
ADD	219	IFTIMIA, Ileana, et al.; "Theory ... scattering of molecules from surface"; Phys. Rev. B (2002) 65, Article 125401	-

Examiner Signature: <u>Alan D. Diamond</u>	Date Considered: <u>5/10/05</u>
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Sheet 26 of 62

## Complete if Known

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

## OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials <sup>1</sup>	Cite No. <sup>2</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	Y <sup>3</sup>
ADD	220	ISHIKAWA, Yasuyuki, et al.; "Energetics of H <sub>2</sub> O dissociation and COads+OHads reaction -- Pt."; Surf. Sci. preprints SUSC 12830, 27 April 2002	-
ADD	221	JOHNSON, R. Collin; "Molecular substitution ...terahertz switch arrays"; EB Times, (04/10/00, 3:35 p.m. EST) <a href="http://www.eet.com/story/0BG20000410S0057">http://www.eet.com/story/0BG20000410S0057</a> (Date Unknown).	-
ADD	222	KAO, Chia-Ling, et al.; "The adsorption ... molecular carbon dioxide on Pt(111) and Pd(111)"; Surf. Sci., (2001) Article 12570	-
ADD	223	KATZ, Gil, et al.; "Non-Adiabatic Charge Transfer Process of Oxygen on metal Surfaces"; Surf. Sci. 425(1) (1999) pp. 1-14	-
ADD	224	KAWAKAMI, R. K., et al.; "Quantum-well states in copper thin films"; Nature, 398, (1999) pp 132 - 134	-
ADD	225	KOMEDA, T., et al.; "Lateral Hopping of Molecules Induced by Excitation of Internal Vibration..."; Science, 295, (2002) pp 2055-2058	-
ADD	226	LEWIS, Steven P., et al.; "Continuum Elastic Theory of Adsorbate Vibrational Relaxation"; J. Chem. Phys. 108, 1157 (1998)	-
ADD	227	LEWIS, Steven P., et al.; "Substrate-adsorbate coupling in CO-adsorbed copper"; Phys. Rev. Lett. 77, 3241 (1996)	-
ADD	228	Li, Shengping, et al.; "Generation of wavelength-tunable single-mode picosecond pulses ..."; Appl. Phys. Lett. 76, (2000) pp 3676 - 3678	-

Same as cite no. 92

Same as cite no. 94

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Sheet 27

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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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ADD	229	MITSUMI, T., et al.; "Coadsorption and Interactions of O and H on Pd(111)"; Surf. Sci., Article 12767, (2002)	-
ADD	230	MOULA, Md. Golam, et al.; "Velocity distribution of desorbing CO <sub>2</sub> in CO oxidation on Pd(110)..."; Applied Surf. Sci., 169-170, pp 268-272 (2001)	-
ADD	231	MULET, Jean-Philippe, et al.; "Nanoscale radiative heat transfer between a small particle ..."; Appl. Phys. Lett., 78, (2001) p 2931	-
ADD	232	NIENHAUS, H., et al.; "Direct detection of electron-hole pairs generated by chemical reactions on metal surfaces"; Surf. Sci. 445 (2000) pp 335-342	-
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ADD	235	NIENHAUS, Hermann; "Electron-hole pair creation by reactions at metal surfaces"; APS, March 20-26, 1999, Atlanta, GA, Session SC33 [SC33.01]	-
ADD	236	NIENHAUS, H., et al.; "Electron-Hole Pair Creation at Ag and Cu ... of Atomic Hydrogen and Deuterium"; Phys. Rev. Lett., 82, (1999) pp. 446-449	-
ADD	237	NOLAN P. D., et al.; "Direct verification of... precursor to oxygen dissociation on Pd(111)"; Surf. Sci. v. 419(1) pp. L107-L113, (1998)	-

Same as cite no. 102

Same as cite no. 103

Same as cite no. 104

Same as cite no. 106

Same as cite no. 101

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Sheet 28 of 62

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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AD	238	NOLAN, P. D., et al.; "Molecularly chemisorbed intermediates to oxygen adsorption on Pt ..."; J. Chem. Phys. 111, (1999), pp 3696 - 3704	- Same as cite no. 107
AD	239	NOLAN, P. D., et al.; "Translational ... Precursors to Oxygen Adsorption on Pt(111)"; Phys. Rev. Lett. 81, (1998) pp 3179 - 3182	- Same as cite no. 105
AD	240	OGAWA, S., et al.; "Optical ... and Femtosecond Dynamics in Ag/Fc(100) Quantum Wells"; Phys. Rev. Lett. 88, 116801 (2002)	- Same as cite no. 109
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AD	245	RINNEMO, Mats; "Catalytic Ignition and Kinetic Phase Transitions"; 1996; <a href="http://www2.lib.chalmers.se/cih/diss/doc/9596/RinnemoMats.html">http://www2.lib.chalmers.se/cih/diss/doc/9596/RinnemoMats.html</a>	-
AD	246	ROBERTSON, A. J. B.; "Catalysis of Gas Reactions by Metals"; Logos Press Limited; 1970; LC # 70-80936; pp. 1-5, 10, 41; Great Britain, Adlard & son Ltd	-

Examiner Signature	<i>Alan D. Diamond</i>	Date Considered	5/10/05
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Sheet 29 of 62

## **Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

## **OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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ADD	247	SCHEWE, P., et al.; "CO <sub>2</sub> Production at the Single-Molecule Level"; <a href="http://www.alp.org/enews/physnews/2001/split/561-1.html">http://www.alp.org/enews/physnews/2001/split/561-1.html</a> (2001).	-
ADD	248	SHENG, H., et al.; "Schottky diode with Ag on (110) epitaxial ZnO film"; Appl. Phys. Lett. (2002) 80, pp. 2132-2134	-
ADD	249	SMIT, O. D. J., et al.; "Enhanced tunneling across nanometer-scale metal-semiconductor interfaces"; Appl. Phys. Lett. (2002) 80, pp. 2568-2570	-
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ADD	253	SVENSSON, K., et al.; "Dipole Active Vibrational Motion in the Physisorption Well"; Phys. Rev. Lett., 78, (1997) pp 2016-2019	-
ADD	254	TARVER, Craig M.; "Non-Equilibrium Chemical Kinetic ... Explosive Reactive Flows"; Fall 1999 IMA Workshop: High-Speed Combustion in Gaseous and Condensed-Phase	-
ADD	255	TAYLOR, R.A., et al.; "Strong Electron-LO Phonon Scattering and Hot Carrier Relaxation in GaN"; <a href="http://www.physics.ox.ac.uk/~rtaylor/images/ha249kw3.pdf">http://www.physics.ox.ac.uk/~rtaylor/images/ha249kw3.pdf</a> (Date Unknown)	-
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Sheet 30 of 62

## **Complete If Known**

Application Number	10/825,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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AD	256	TEODORSCU, C.M., et al.; "Structure of Fe layers grown on InAs ..."; Appl. Surf. Sci., 166, (2000) pp 137-142	-
AD	257	TIUSAN, C., et al.; "Quantum coherent transport versus diode-like effect in ..."; Appl. Phys. Lett. 79, (2001) pp 4231-4233	-
AD	258	TRIPA, C. Emil, et al.; "Surface-aligned photochemistry: Aiming reactive oxygen atoms..."; J. Chem. Phys., (2000) 112 pp. 2463-2469	-
AD	259	TRIPA, C. Emil, et al.; "Surface-aligned reaction of photogenerated oxygen atoms with ..."; Nature 398, pp 591 - 593 (1999)	-
AD	260	TRIPA, C. Emil; "Special Adsorption and Reaction Effects at Step Defect Sites on Platinum ..."; <a href="http://www.chem.plt.edu/thesis.html#tripa">http://www.chem.plt.edu/thesis.html#tripa</a> (abstract only) (Date Unknown);	-
AD	261	VOLKENING, S., et al.; "CO oxidation on Pt(111)—Scanning tunneling microscopy experiments ..."; J. Chem. Phys. (2001) 114, pp. 6382-6395	-
AD	262	WATSON, D.T.P., et al.; "Isothermal and temperature-programmed oxidation of CH over Pt..."; Surf. Sci. preprint, year 2001	-
AD	263	WATSON, D.T.P., et al.; "Surface products of the dissociative adsorption of methane on Pt ..."; Surf. Sci. preprint, c. October 2001	-

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*Alan D. Diamond*

Date Considered

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Sheet 31 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	264	WILKE, Steffen, et al.; "Theoretical investigation of water formation on Rh and Pt Surfaces"; J. Chem. Phys., 112, (2000) PP 9986 - 9995	-
ADD	265	WINTERLIN, J. et al.; "Atomic ...Reaction Rates ... Surface-Catalyzed ..."; Science, 278, (1997) pp. 1931 - 1934	-
ADD	266	WINTERLIN, J. R., et al.; "Existence of a "Hot" Atom Mechanism for the Dissociation of O <sub>2</sub> on Pt(111)"; Phys. Rev. Lett., 77, (1996), pp 123 - 126	-
ADD	267	ZAMBELLI, T., et al.; "Complex pathways in dissociative adsorption of oxygen on platinum"; Nature 390, pp 495 - 497 (1997)	-
ADD	268	ZHDANOV, V. P., et al.; "Substrate-mediated photoinduced chemical reactions on ultrathin metal films"; Surf. Sci., V. 432 (#3) pp L599-L603, (1999)	-
ADD	269	ZHDANOV, Vladimir P.; "Nm-sized metal particles on a semiconductor surface, Schottky ..."; Surf. Sci. PROOF SUSC 2931, 20 April 2002	-
ADD	270	ZHUKOV, V. P., et al.; "Lifetimes of quasiparticle excitations in 4d transition metals ..."; Phys. Rev. B (2002) 65, Article 115116	-

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Sheet 32 of 62

Application Number 10/625,801  
Filing Date 7/23/2003  
First Named Inventor Anthony C. Zuppero  
Art Unit 1753  
Examiner Name Alan D. Diamond  
Attorney Docket Number 22122878-70

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AD	271	US-5032885	08-1999	DeBellis et al. Same as cite no. 15	
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Sheet 33 of 62

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Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	274	REE, J. et al., "Dynamics of Gas-Surface Interactions: Reaction of Atomic Oxygen with Chemisorbed Hydrogen on TUNGSTEN," Journal of Physical Chemistry, Vol. 101 (#25), pp. 4523 - 4534, June 19, 1997.	-
ADD	275	REE, J. et al., "Reaction of atomic oxygen with adsorbed carbon monoxide on a platinum surface," Journal of Chemical Physics, Vol. 104, Issue 2, pp. 742 - 757, January 8, 1996.	-
ADD	276	NOLAN, P.D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt(111): A molecular beam and electron energy-loss spectroscopy study," Journal of Chemical Physics, Vol. 111, No. 8, pp. 3696 - 3704, August 22, 1999.	Same as cite no. 107
ADD	277	NOLAN, P. D. et al., "Translation Energy Selection of Molecular Precursors to Oxygen Adsorption on Pt (111)," Physical Review Letters, Vol. 81, No. 15, pp. 3179 - 3182, October 12, 1998.	Same as cite no. 105
ADD	278	MORPHY, M. J. et al., "Inverted vibrational distributions from N <sub>2</sub> recombination at Ru(001): Evidence for a metastable molecular chemisorption well," Journal of Chemical Physics, Vol. 110, No. 14, pp. 6954 - 6962, April 8, 1999.	-
ADD	279	KIM, M. S. et al., "Reaction of Gas-Phase Atomic Hydrogen with Chemisorbed Hydrogen Atoms on an Iron Surface," Bull. Korean Chem. Soc., Vol. 18, No. 9, pp. 985 - 994, May 22, 1997.	-
ADD	280	BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, pp. 1042 - 1045, August 13, 1999. www.sciencemag.org	-

Examiner  
Signature

Date

Considered

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1 Unique citation designation number. 2 Applicant is to place a check mark here if English language Translation is attached.

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**  
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Sheet 34 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>1</sup>
ADD	281	NOLAN, P. D. et al., "Direct verification of a high-translational-energy molecular precursor to oxygen dissociation on Pd(111)," Surface Science Letters, Vol. 419, pp. L107 - L113, September 24, 1998.	Same as cite no. 108
ADD	282	DAVIS, J. E. et al., "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)," Journal of Chem. Phys., Vol. 107(3), pp. 943 - 952, July 15, 1997.	Same as cite no. 65
ADD	283	TRIPA, C. Emil et al., "Surface-aligned reaction of photo-generated oxygen atoms with carbon monoxide targets," Nature, Vol. 398, pp. 591 - 593, April 15, 1999, www.nature.com.	Same as cite no. 131
ADD	284	SHIN HK, "Vibrationally excited OD Radicals from the Reaction of Oxygen-Atoms with Chemisorbed Deuterium on TUNGSTEN," Journals of Physical Chemistry, Vol. 102(#13), pp. 2372 - 2380, March 26, 1998.	-
ADD	285	TRIPA, C. Emil et al., "Kinetics measurements of CO photo-oxidation on Pt(111)," Journal of Chemical Physics, Vol. 105, Issue 4, pp. 1691 - 1696, July 22, 1996.	Same as cite no. 132

Examiner Signature		Date Considered	5/10/05
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	35	of	62
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**Complete if Known**

Application Number	10/825,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

U.S. PATENT DOCUMENTS

[illegible]

## FOREIGN PATENT DOCUMENTS

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<sup>1</sup> Unique classification designation number. <sup>2</sup> See attached Kinds of U.S. Patent Documents. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 19 if possible. <sup>6</sup> Applicant is to place a check mark here if English language Translation is attached.

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Sheet	36	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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Sheet	37	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	38	of	62
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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

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Sheet	39	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet 40 of 62


**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials*	Ch. No.†	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
ADD	302	FRBSE, et al., "Analysis of Current/Voltage Curves at n-Si/SiO <sub>2</sub> /Pt Electrodes", J. Electrochem. Soc., December 1994, pp. 3375-3382, Vol. 141, No. 12, The Electrochemical Society, Inc.	—
ADD	303	FRBSE, et al., "Methanol Oxidation at p-Si/Pt Electrodes, Evidence for Hot Hole Reactivity", J. Phys. Chem., 1995, pp. 6074-6083, Vol. 99, American Chemical Society.	—
ADD	304	GADZUK, "Multiple Electron Processes in Hot-Electron Femtochemistry at Surfaces", <a href="http://www.esl.nist.gov/div837/837.03/highlite/gadzuk1999.htm">http://www.esl.nist.gov/div837/837.03/highlite/gadzuk1999.htm</a> . (1999).	—
ADD	305	FRBSE, et al., "Hot Electron Reduction at Etched n-Si/Pt Thin Film Electrodes", J. Electrochem. Soc., September 1994, pp. 2402-2409, Vol. 103, The Electrochemical Society Inc.	—
ADD	306	GAILLARD, et al., "Hot Electron Generation in Aqueous Solution at Oxide-Covered Tantalum Electrodes, Reduction of Methylpyridinium and Electrogenerated Chemiluminescence of Ru(bpy) <sub>3</sub> <sup>2+</sup> ", J. Phys. Chem., 1999, pp. 667-674, Vol. 103, American Chemical Society.	—
ADD	307	SUNG, et al., "Demonstration of Electrochemical Generation of Solution-Phase Hot Electrons at Oxide-Covered Tantalum Electrodes by Direct Electrogenerated Chemiluminescence", J. Phys. Chem., 1998, pp. 9797-9805, Vol. 102, American Chemical Society.	—
ADD	308	ZHDANOV, et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science, 1999, pp. L599-L603, Vol. 432, Elsevier Science B.V.	—

Same as cite no. 150

Examiner Signature		Date Considered	5/10/05
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Sheet 41 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

[illegible]

**FOREIGN PATENT DOCUMENTS**

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ad 17

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many shoots as necessary)

Sheet	42	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT**

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Sheet 43 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	
AD	316	BONN, M. et al., "Phonon-Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)," Science, Vol. 285, No. 5430, Issue of 13 August 1999, pp. 1042-1045.	Same as cite no. 280
AD	317	DAVIS, J. E. et al., "Kinetics and dynamics of the dissociative chemisorption of oxygen on Ir(111)," J. Chem. Phys., 107 No. 3, 15 July 1997, pp. 943-951.	Same as cite no. 65
AD	318	GADZUK, J. W., "Hot-electron femtochemistry at surfaces: on the role of multiple electron processes in desorption," Chemical Physics, Vol. 251, year 2000, pp. 87-97.	-
AD	319	GADZUK, J. W., "Resonance-assisted hot electron femtochemistry at surfaces," Physical Review Letters, May 27, 1996, Vol. 76, Issue 22, pp. 4234-4237.	-
AD	320	GE, N.-H. et al., "Femtosecond Dynamics of Electron Localization at Interfaces," Science, vol. 279, No. 5348, Issue of 9 Jan 1998, pp. 202-205.	-
AD	321	GAO, Shiwu, "Quantum kinetic theory of vibrational heating and bond breaking by hot electrons," Physical Review B, Vol. 55, No. 3, 15 Jan 1997-X, pp. 1876-1886.	-
AD	322	HOU, H. et al., "Enhanced Reactivity of Highly Vibrationally Excited Molecules on Metal Surfaces," Science, Vol. 284, No. 5420, Issue of 4 Jun 1999, pp. 1647-1650.	-
AD	323	NIENHAUS, H. et al., "Direct detection of electron hole pairs generated by chemical reactions on metal surfaces," Surface Science 445 (2000) pp. 335-342.	Same as cite no. 103
AD	324	NIENHAUS, H. et al., "Selective H atom sensors using ultrathin Ag/Si Schottky diodes," Applied Physics Letters, June 28, 1999, Vol. 74, Issue 26, pp. 4046-4048.	Same as cite no. 106
AD	325	GAILLARD, Frederic et al., "Hot electron generation in aqueous solution at oxide-covered tantalum electrodes. Reduction of methylpyridinium and electrogenerated chemiluminescence of Ru(bpy)32+," Journal of Physical Chemistry B., Vol. 103, No. 4, January 28 1999, pp. 667-74.	Same as cite no. 306
AD	326	ENGSTROM, Ulrika and RYBERG, Roger, "Comparing the vibrational properties of low-energy modes of a molecular and an atomic adsorbate: CO and O on Pt (111)," Journal Of Chemical Physics, Vol. 112, No. 4, 22 January 2000, pp. 1959-1965.	Same as cite no. 77

Examiner Signature		Date Considered	5/19/05
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Sheet 44 of 62

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
ADD	327	NOLAN, P. D. et al., "Molecularly chemisorbed intermediates to oxygen adsorption on Pt (111): A molecular beam and electron energy-loss spectroscopy study," Journal Of Chemical Physics, Vol. 111, No. 8, 22 August 1999.	Same as cite no. 107
ADD	328	NOLAN P. D. et al., "Direct verification of a high-translational-energy molecular precursor to oxygen dissociation on Pd(111)," Surface Science Vol. 419, pp. L107-L113, December 24, 1998.	Same as cite no. 108
ADD	329	OTTO, Andreas et al., "Role of atomic scale roughness in hot electron chemistry," Journal of Physical Chemistry B, Vol. 103, No. 14, April 8, 1999, pp. 2696-2701.	
ADD	330	PLIHAL, M. et al., "Role of intra-adsorbate Coulomb correlations in energy transfer at metal surfaces," Physical Review B, Vol. 58, No. 4, July 15, 1998, pp. 2191-2206.	Same as cite no. 168
ADD	331	SUNG, Yung-Eun et al., "Enhancement of electrochemical hot electron injection into electrolyte solutions at oxide-covered tantalum electrodes by thin platinum films," Journal of Physical Chemistry B., Vol. 102, No. 49, December 3 1998, pp. 9806-11.	
ADD	332	ZHDANOV, V. P. et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films," Surface Science, Vol. 432 (#3), pp. L599-L603, July 20, 1999.	Same as cite no. 150
ADD	333	NIENHAUS, H., "Electron-hole pair creation by reactions at metal surfaces," American Physical Society, Centennial Meeting Program, March 20-26, 1999, Atlanta, GA, Session SC33 - Metal Surfaces: Adsorbates. <a href="http://www.aps.org/meet/CENT99/BAPS/">http://www.aps.org/meet/CENT99/BAPS/</a>	Same as cite no. 235
ADD	334	NIENHAUS, H et al., "Electron-Hole Pair Creation at Ag and Cu Surfaces by Adsorption of Atomic Hydrogen and Deuterium," Physical Review Letters, Vol. 82, Issue 2, January 11, 1999, pp. 446-449.	Same as cite no. 101

Examiner Signature: 	Date Considered: 5/10/05
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\* Unique citation designation number. \* Applicant is to place a check mark here if English language Translation is attached.

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	45	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

[illegible]

**Exhibitor  
Signature**

Alan

Date \_\_\_\_\_

**Considered**

5/10/05

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet	46	of	62
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**Complete If Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS**

[illegible]

**Examiner  
Signature**

Al Dine

Date Considered

5/10/05

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 47 of 62

Complete if Known

Application Number 10/625,801  
Filing Date 7/23/2003  
First Named Inventor Anthony C. Zuppero  
Art Unit 1753  
Examiner Name Alan D. Diamond  
Attorney Docket Number 22122878-70

Examiner Initials*	Cite No. <sup>1</sup>	U. S. PATENT DOCUMENTS		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Document Number	Number-Kind Code <sup>2</sup> (if known)			
ADD	337	US-6,537,828		03-2003	Zarling et al.	
ADD	338	US-6,444,476		09-2002	Morgan, Christopher Grant	
ADD	339	US-6,399,397		06-2002	Zarling et al.	
ADD	340	US-6,312,914		11-2001	Kardos et al.	
ADD	341	US-6,251,687		06-2001	Buechler et al.	
ADD	342	US-6,238,931		05-2001	Buechler et al.	
ADD	343	US-6,159,686		12-2000	Kardos et al.	
ADD	344	US-5,891,856		04-1999	Zarling et al.	
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Examiner Initials*	Cite No. <sup>1</sup>	FOREIGN PATENT DOCUMENTS		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>3</sup>
		Foreign Patent Document	Country Code <sup>4</sup> Number <sup>5</sup> Kind Code <sup>6</sup> (if known)				

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Sheet 48 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

Examiner Initials*	Cite No.	U. S. PATENT DOCUMENTS			
		Document Number Number-Kind Code <sup>2</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
ADD	345	US-2003/0207331	11-2003	Wilson et al.	
ADD	346	US-2003/0166307	09-2003	Zuppero et al.	
ADD	347	US-2003/0100119	05-2003	Weinberg et al.	
ADD	348	US-2003/0030067	02-2003	Chen, Wei	
ADD	349	US-2003/0019517	01-2003	McFarland, Erick W.	
ADD	350	US-2002/0121088	09-2002	Zuppero et al.	Same as cite no. 177
ADD	351	US-2002/0070632	06-2002	Zuppero et al.	Same as cite no. 5
ADD	352	US-2002/0045190	04-2002	Wilson et al.	
ADD	353	US-2002/0017827	02-2002	Zuppero et al.	
ADD	354	US-6,700,056	03-2004	Zuppero et al.	
ADD	355	US-6,649,823	11-2003	Zuppero et al.	
		US-			

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		Foreign Patent Document Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages Or Relevant Figures Appear

Examiner Signature	<i>Alan D. Diamond</i>	Date Considered	5/10/05
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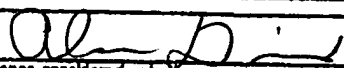
Sheet 49 of 62

**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> (if known)			
ADD	356	US-5,783,189	06-1998	Buechler et al.	
ADD	357	US-5,736,410	04-1998	Zarling et al.	
ADD	358	US-5,698,397	12-1997	Zarling et al.	
ADD	359	US-5,674,808	10-1997	Zarling et al.	
ADD	360	US-5,632,870	05-1997	Kucherov, Yan R.	
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FOREIGN PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known)			
ADD	361	WO 01/28677A1	04-2001	Zuppero et al.	
ADD	362	JP-02157012A	08-1990		

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# **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

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Sheet 50 of 62

## **Complete If Known**

Application Number 10/625,801  
Filing Date 7/23/2003  
First Named Inventor Anthony C. Zuppero  
Art Unit 1753  
Examiner Name Alan D. Diamond  
Attorney Docket Number 22122878-70

## **U.S. PATENT DOCUMENTS**

Examiner Initials <sup>2</sup>	Cite No. <sup>1</sup>	Document Number Number - Kind Code <sup>3</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
AD	363	US- 2002/0121088 A1	09-05-2002	Zuppero et al.	Same as cite no. 177
AD	364	US-4,012,301	03-1977	Rich et al.	Same as cite no. 12
AD	365	US-5,470,395	11-1995	Yater et al.	Same as cite no. 13
AD	366	US-2003/0000570 A1	01-2003	Zuppero et al.	
AD	367	US-2003/0166307 A1	09-2003	Zuppero et al.	Same as cite no. 346

## **FOREIGN PATENT DOCUMENTS**

Examiner Initials <sup>2</sup>	Cite No. <sup>1</sup>	Foreign Patent Document Country Code <sup>4</sup> - Number <sup>1</sup> - Kind Code <sup>3</sup> (if known)	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T <sup>5</sup>
AD	68	wo 01/29938 A1	4-2001	NeoKismet L.L.C.		

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*Alan D. Diamond*

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<sup>1</sup> Applicant's unique citation designation number (optional). <sup>2</sup> See Kind Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 991.04. <sup>3</sup> Enter Office that issued the document, by the two-letter code (WIPO Standard 8T.3). <sup>4</sup> For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup> Kind of document by the appropriate symbols as indicated on the document under WIPO Standard 8T. 16 if possible. <sup>6</sup> Applicant is to place a check mark here if English language translation is attached.  
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**INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT.**

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Sheet	51	of	62
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**Complete If Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zupperro
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

**U.S. PATENT DOCUMENTS**

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**FOREIGN PATENT DOCUMENTS**

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al D.

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 52 of 62

## Complete if Known

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppers
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

## OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	Y2
ADD	373	ACHERMANN, M. et al., "Carrier dynamics around nano-scale Schottky contacts: a femtosecond near-field study", Applied Surface Science 7659 (2002) 1-4.	-
ADD	374	AESCHLIMANN, M. et al., "Competing nonradiative channels for hot electron induced surface photochemistry", Chemical Physics, April 15, 1996, pp. 127-141, Vol: 205, Issue: 1-2.	-
ADD	375	AESCHLIMANN, M. et al., "Ultrafast electron dynamics in metals", The Ultrafast Surface Science Group, <a href="http://www.ilp.physik.uni-essen.de/aeschlimann/2y_photo.htm">http://www.ilp.physik.uni-essen.de/aeschlimann/2y_photo.htm</a> (Date Unknown).	Same as cite no. 37
ADD	376	AUERBACH, D. et al., "Reagent Vibrational Excitation: A Key to Understanding Chemical Dynamics at Surfaces?", abstract only. (Date Unknown).	-
ADD	377	BALANDIN, A. et al., "Significant decrease of the lattice thermal conductivity due to phonon confinement in a free-standing semiconductor quantum well", Physical Review B, July 15, 1998; Vol. 58, Issue 3, pp. 1545-1549.	-
ADD	378	BALANDIN, A. et al., "Effect of phonon confinement on the thermoelectric figure of merit of quantum wells", Journal of Applied Physics, December 1, 1998, Vol. 84, Issue 11, pp. 6149-6151.	Same as cite no. 40
ADD	379	BONN, M. et al., "Phonon- Versus Electron-Mediated Desorption and Oxidation of CO on Ru(0001)", Science, Vol. 285, Number 5430, Issue of 13 Aug 1999, pp. 1042 - 1045.	Same as cite no. 280
ADD	380	CHANG, Y. et al., "Coherent phonon spectroscopy of GaAs surfaces using time-resolved second-harmonic generation", Chemical Physics, 251/1-3, pages 283-308, (2000).	Same as cite no. 52
ADD	381	CHEN, C. et al., "Hot electron reduction at n-Si/Au thin film electrodes", Journal-of-the-Electrochemical-Society, Vol. 139, November 1992, pages 3243-3249.	-
ADD	382	CHOI, C.K. et al., "Ultrafast carrier dynamics in a highly excited GaN epilayer", Physical Review B, Vol. 63, 115315, 15 March 2001, 6 pages.	Same as cite no. 66

Examiner Signature

*Alan D. Diamond*

Date

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5/10/05

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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet 53 of 62

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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

## OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	TS
ADD	383	DEBERNARDI, A. et al., "Anharmonic Phonon Lifetimes in Semiconductors from Density-Functional Perturbation Theory", Physical Review Letters, VOL. 75, NUMBER 9, 28 AUGUST 1995, pp 1819 - 1822.	Same as cite no. 64
ADD	384	DELFATTI, N. et al., "Temperature-dependent electron-lattice thermalization in GaAs", Physical Review B, 15 FEBRUARY 1999-I, Vol. 59, Number 7, pp 4576 - 4579.	Same as cite no. 74
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Sheet 54 of 62

## Complete If Known

Application Number 10/625,801  
 Filing Date 7/23/2003  
 First Named Inventor Anthony C. Zuppero  
 Art Unit 1753  
 Examiner Name Alan D. Diamond  
 Attorney Docket Number 22122878-70

## OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T <sup>2</sup>
ADD	394	GAILLARD, F. et al., "Hot electron generation in aqueous solution at oxide-covered tantalum electrodes. Reduction of methylpyridinium and electrogenerated chemiluminescence of Ru(bpy) <sub>3</sub> 12+", Journal of Physical Chemistry B, Vol. 103, No. 4, January 28, 1999, pages 667-74.	Same as cite no. 306
ADD	395	GAO, S., "Quantum kinetic theory of vibrational heating and bond breaking by hot electrons", Physical Review B, Vol. 55, No. 3, 15 January 1997-I, pages 1876-1886.	Same as cite no. 321
ADD	396	GERGEN, B. et al., "Chemically Induced Electronic Excitations at Metal Surfaces", Science, Vol. 294, Number 5551, Issue of 21 December 2001, pages 2521-2523.	Same as cite no. 82
ADD	397	GUO, J. et al., "The desorption yield dependence on wavelength of femtosecond laser from CO/Cu(111)", Annual Meeting of the American Physical Society, March 1999, Atlanta, GA; Session BC18 - Surfaces (General), ORAL session, March 21; Room 258W, GWCC [BC18.06].	
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Sheet 55 of 62

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Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
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Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	404	PLIHAL, M. et al., "Role of intra-adsorbate Coulomb correlations in energy transfer at metal surfaces", Physical Review B, July 15, 1998, Vol. 58, Issue 4, pages 2191-2206. Same as cite no. 168	
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Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	413	DANIEL J. AUERBACH, Hitting the Surface Softly, www.sciencemag.org, Vol 294 Science, December 21, 2001, pp. 2488-2489.	
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Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	424	HARRISON, P., SOREF, R.A.; Population-inversion and gain estimates for semiconductor TASER. (Date Unknown). Same as cite no. 29	
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ADD	430	MD. GOLAM MOULA, SURGIO WAKO, GENGYU CAO, IVAN KOBAL, YUICHI OHNO, TATSUO MATSUSHIMA; Velocity distribution of desorbed CO2 in CO oxidation on Pd(110) under steady-state conditions; applied surface science; 169-170 (2001); Pgs: 268-272. Same as cite no. 230	
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First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	432	H. NIEHAUS et al., "Direct detection of electron-hole pairs generated by chemical reaction on metal surfaces", Surface Science 445 (2000), Pages 3350342.	Same as cite no. 103
ADD	433	H. NIEHAUS et al., "Selective H atom sensors using ultrathin Ag/Si Schottky diodes", Applied Physics Letters, Volume 74, Number 26, 28 June 1999, Pages 4046-4048.	Same as cite no. 106
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ADD	437	N. PONTIUS et al., "Size-dependent hot-electron dynamics in small Pd <sub>n</sub> -cluster", Journal of Chemical Physics, Volume 115, Number 22, 8 December 2001, Pages 10479-10483.	Same as cite no. 121
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Sheet 59 of 62**Complete if Known**

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First Named Inventor	Anthony C. Zupparo
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Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

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ADD	440	V. P. ZHDANOV et al., "Substrate-mediated photoinduced chemical reactions on ultrathin metal films", Surface Science 432 (1999), Pages L599-L603.	Same as cite no. 150
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ADD	442	G. SUN et al., "Phonon Pumped SiGe/Si Interminiband Terahertz Laser", Pages 1-11. (Date Unknown).	Same as cite no. 35
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OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, etc. (when appropriate)	T <sup>2</sup>
ADD	448	P. ARMOUR et al., "Hot-electron transmission through metal-metal interfaces: a study of Au/Fe/Au trilayers in GaAs substrates", Applied Surface Science 123/124 (1998), Pages 412-417.	
ADD	449	C.D. BEZANT et al., "Intersubband relaxation lifetimes in p-GaAs/AlGaAs quantum wells below the LO-phonon energy measured in a free electron laser experiment", Vacuum Solutions Online, Semicond. Sci. Technol. 14 No. 8 (August 1999) L25-L28, PII: S0268-1242(99)03669-X.	Same as cite no. 46
ADD	450	L. BURGI et al., "Confinement of Surface State Electrons in Fabry-Perot Resonators", Physical Review Letters, Volume 81, Number 24, 14 December 1998, Pages 5370-5373.	Same as cite no. 48
ADD	451	L. CAMPILLO et al., "Inelastic lifetimes of hot electrons in real metals", Physical Review Letters, Volume 83, Number 11, September 13, 1999, Pages 2230-2233.	
ADD	452	CHIANG, T.-C., "Photoemission studies of quantum well states in thin films", Surface Science Reports 39 (2000) pp 181-235	Same as cite no. 63
ADD	453	DE PAULA, A. et al, "Carrier capture processes in semiconductor superlattices due to emission of confined phonons", J. Appl. Phys. 77 (12); 1995 pp 6306-6312.	Same as cite no. 76

Examiner Signature		Date Considered	5/10/05
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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	61	of	62
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**Complete if Known**

Application Number	10/625,801
Filing Date	7/23/2003
First Named Inventor	Anthony C. Zuppero
Art Unit	1753
Examiner Name	Alan D. Diamond
Attorney Docket Number	22122878-70

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code <sup>2</sup> of Invention			
AD	454	US- 6,114,620	09-05-2000	Zuppero et al	—
AD	455	US- 5,641,585	01-24-1997	Lessing et al	—
AD	456	US- 5,583,509	01-14-1997	Zuppero et al	Same as cite no. 312 —
AD	457	US- 4,793,799	12-27-1988	Goldstein et al	—
AD	458	US- 3,694,770	09-1972	Burwell et al	Same as cite no. 286 —
AD	459	US- 3,925,235	12-1975	Lee, Vin-Jang	—
AD	460	US- 4,045,359	08-1977	Fletcher et al	—
AD	461	US- 4,407,705	10-1983	Garscadden et al	—
AD	462	US- 5,048,042	09-1991	Moser et al	Same as cite no. 10 —
AD	463	US- 6,114,620	09-2000	Zuppero et al	Same as cite no. 454 —
AD	464	US- 6,218,608	04-2001	Zuppero et al	—
AD	465	US- 6,222,116	04-2001	Zuppero et al	—
AD	466	US- 6,268,560	07-2001	Zuppero et al	—
AD	467	US- 2001/0018923	09-2001	Zuppero et al	Same as cite no. 272 —
AD	468	US- 6,327,859	12-2001	Zuppero et al	—
AD	469	US- 2002/0017827	02-2002	Zuppero et al	Same as cite no. 353 —
AD	470	US- 2002/0196825	12-2002	Zuppero et al	—
AD	471	US- 2002/0196825	01-2003	Zuppero et al	Same as cite no. 470 —
AD	472	US- 6,649,823	11-2003	Zuppero et al	Same as cite no. 355 —

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**Examiner  
Signature**

Adm. Dist.

Date  
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# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Sheet	62	of	62
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**Complete if Known**

<b>Application Number</b>	<b>10/625,801</b>
<b>Filing Date</b>	<b>7/23/2003</b>
<b>First Named Inventor</b>	<b>Anthony C. Zuppero</b>
<b>Art Unit</b>	<b>1753</b>
<b>Examiner Name</b>	<b>Alan D. Diamond</b>
<b>Attorney Docket Number</b>	<b>22122878-70</b>

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**Examiner  
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